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PATENT SPECIFICATION

Convention Date (France): June 5, 1926. **272,239**

Application Date (in United Kingdom): June 7, 1927. No. 15,008/27.

Complete Accepted: Oct. 13, 1927.

COMPLETE SPECIFICATION.

Improvements in Apparatus for Clamping and Holding Shoe Lasts and Patterns.

I, PAUL AMANN, a citizen of the Republic of France, of 9, rue du Sanglier, Nanterre (Seine), France, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

It is a known fact that shoe lasts are manufactured in standard sizes by the use of reproducing machines of suitable types. However the lasts which are made by such machines are terminated at each end by a wood tenon which is a reproduction of the part which served to maintain the pattern in the reproducing machine, so that it becomes necessary to further operate upon each last in order to remove the said tenons and to perform the various finishing operations.

The finishing work is usually carried out by hand, but in the case in which the shoe lasts are to be placed in machines in which this operation is to be automatically performed, it is necessary to maintain each last and its pattern by the middle part upon such machines, so as to provide for the free position of the parts which remain to be treated. It will be observed that the pieces must be held in the same position for all the lasts of the series, irrespectively of their length and width, and this position corresponds to the position which is adopted for the pattern.

The present invention has for its object a clamping device by which shoe lasts of all sizes can be rapidly seized at the middle part and securely held in order to perform the finishing and polishing operations, the reproduction of such lasts having been effected by copying machines of any kind according to a pattern, in which lasts the corresponding lines are exactly proportional.

This clamping is effected by means of claws or clamps which are mounted in a common support or mandrel and which seize the shoe last or pattern adjacent a cross section situated about midway on the length of the said pattern or last, and which possess a centre of figure, as I have found, the object being seized at points which are practically equidistant from this centre of figure, both for the left foot last and the right foot last, said claws being equally distributed about the said pattern or last. These points of contact are practically situated at the three vertices of an equilateral triangle inscribed in the cross section of the shoe last (right or left), the centre of the triangle being preferably situated on the axis upon which the last or pattern was originally turned in the lathe.

The said invention will be clearly understood with reference to the following description and the appended drawings which are given by way of example.

Fig. 1 is an elevational view, partly in section, of an apparatus for placing and adjusting the said claws upon the last or the pattern.

Fig. 2 is an end view of the apparatus, the last being shown in section on the line x—x of Fig. 1 and the front stock of the apparatus being removed in order to show the said claws.

Fig. 3 is a front view of a constructional form of a claw;

Fig. 4 is the corresponding side view.

Fig. 5 is an end view of one of the two lateral claws for guiding the instep of the last;

Fig. 6 is the corresponding side view.

Fig. 7 is a modification of Fig. 3 in

[*Price* 1/-]

which the claw has two jaws for patterns having two nails.

Figs. 8 and 9 are sections on a larger scale of a right and a left foot last.

Fig. 10 shows the mandrel carrying the last.

As shown in Fig. 1, a shoe last which has been treated in the copying machine is terminated by a wood tenon 1 which is the copy of the claw at the end of the pattern, and it has at the rear end a boss 3 which is the copy of the actuating claw for the pattern.

At the centre of these respective end pieces 1 and 3 are formed the prints 1^a and 3^a of the point and of the actuating claw of the lathe which served to produce the shoe last.

The middle part of the said last, which is shown in vertical section in Fig. 2 on the line $x—x$ of Fig. 1, and on a larger scale in Fig. 8, consists of a part which is generally bulged, without any other projections than that of the instep 6.

In this section, Figs. 2, 8 and 9, it will be noted that the outline (which takes in the bones of the foot such as the tarsus, metatarsus and instep) has a centre of Figure 0.

It will be further noted that a line connecting the top of the instep 6 and the centre of Figure 0 will intersect the base at 7 at a point at which the tangent T to the periphery of the last is substantially perpendicular to the straight line 6—0—7.

If from the point 0 there are drawn on either side of the straight line 6—7 two straight lines spaced at 120 degrees, these will intersect the periphery of the last at two points 8 and 9, at which in virtue of the configuration of the foot and of the rules of shoe manufacture, the tangents T^1 and T^2 to the arcs of the periphery will be substantially perpendicular to the straight lines 0—8 and 0—9; the point 0 is thus the centre which is inscribed in the section of the shoe last, passing through the points 7—8—9 which form the vertices of an equilateral triangle.

These points of contact 7—8—9 pertain to the outline of the right foot last A (Fig. 8) as well as to the outline of the left foot last A^1 (Fig. 9).

The clamping system, the subject matter of the present invention, is based upon these observations, and it consists in seizing and maintaining the shoe last by a set of claws, clamps or like elements which are applied at the points 7—8—9 of the last or the pattern. These three claws or clamps serve to hold and also to center, at the same points, all shoe lasts of whatever size which are reproduced according to a given pattern, whether for the right foot or the left foot, due to the function of the points 7—8—9. It is obviously preferable that the centre of Figure 0 should be situated upon the axis $y—y$ about which the last has been previously turned or shaped during its manufacture.

Fig. 1 shows an apparatus for mounting and centering the clamping device upon the shoe last A. As observed in Fig 2, the three clamps or grips 11—12—13 are radially slidable in the grooves 10^a (spaced at 120 degrees) of the mandrel 10; they are pushed in by the same amount until they make contact with the last A, by means of any suitable mechanism, for instance a disc 14 having the spiral grooves 14^a in which are engaged the corresponding projections 11^a—12^a—13^a of the claws or clamps 11—12—13. The disc 14 is mounted in a bearing member 10^b, keyed to the mandrel 10, which supports a small pinion 15 engaging teeth formed on the periphery of the disc 14. It will be noted that by turning the pinion 15 by means of a wrench inserted at 15^a, this will cause the rotation of the disc 14 and hence the radial motion of the clamps or grips 11—12—13 by equal amounts, until they strongly clamp the last or the pattern.

In the apparatus shown in Fig. 1, the mandrel 10 is disposed in a circular support 16 which is formed in one with the main frame of the machine 17. The two guides 18 and 19 which are perpendicular to the plane of the circular support will guide the two stocks 20—21 which are actuated by the screw 22 having right and left hand threads which is rotated by a handle or a hand wheel 23.

The head of the stock 21 is traversed by the screw 24 which is rotated by the hand wheel 25 and terminated in a point 1^b which engages in the recess 1^a of the tenon 1 of the last or the pattern A, whilst the stock 20 carries a claw or jaw 3^b engaging in the recess 3^a of the tenon 3 of the last or the pattern, so that the said last or pattern is pressed and maintained between the point and the said claw; I then bring the claws of the clamping device into contact with the pattern or the last, as above specified, and when the pattern or the last is thus held by the said clamping device, I separate the stocks 20—21 so as to disengage the tenons 1 and 3; I may then remove the mandrel 10 (together with the last which it carries in the lengthwise direction) from the circular support 16; the said mandrel shown in Fig. 10, may then be mounted in a suitable cir-

cular support, so as to finish and polish the ends of the last, according to the ends of a pattern which is held in an analogous manner in a similar mandrel, these two mandrels being disposed in a suitable reproducing machine.

To increase the adhesion of the said claws to the last, I may provide at the points 7—8—9 of the pattern three bosses which consist for example of three nails driven in at these points.

The three clamps may be for example constructed as shown in Figs. 3 and 4. The copying machine will therefore reproduce three corresponding bosses upon the shoe last under treatment.

Figs. 3 and 4 show a constructional form of clamps which is adapted to seize the nails or the bosses of the lasts or patterns. The clamp comprises a forked bracket 26 in which is held an arm 27 by means of two oppositely disposed screws 28 which are screwed to the maximum in the branches of the forked bracket. In these conditions, if the arm 27 should tend to pivot in either direction, it would be screwed upon one of the two screws 28 and would thus be held against one of the two branches of said bracket 26, after the manner of a lock nut.

To the threaded end of the arm 27 is screwed a nut 30 whose contact surface forms a claw or jaw and is adapted to be applied against one of the nails of the pattern or one of the projections or bosses of the lasts.

Figs. 5 and 6 represent a clamp which is analogous to the preceding, but in which the end or arm is provided with a seizing device comprising a ball-and-socket joint.

Upon the axis and between the branches of the fork 26 are held the two hemispherical shells 31—32 which are mounted upon two screws 28—like the arm 27 in the preceding case and which may be held together by the two screws 33. In the said shells may be turned in all directions the ends 34^a—35^a which are also spherical of two long arms or wings 34—35, and a ball 36 is provided in the interior so as to form a ball joint and to serve as a support when the device is clamped.

When two nails are driven into the pattern in order to provide two bosses upon the shoe lasts, I employ clamps such as are shown in Fig. 7, in which the arms consist of a plate 40 pivoted on the forked bracket 26, said plate being traversed by two screws 41 terminated by the claws 42; said screws may have a head 43 which is slotted or has flat sides for adjustment purposes.

Clamps of this type which are adapted to seize nails or bosses disposed in pairs, will assure a perfect centering and maintenance of the lasts under treatment.

It is obvious that modifications may be made in the details of construction of a device of this class, without departing from the spirit of the present invention as defined by the claims, and in particular, the claws or clamps may be secured individually in the mandrel in which they are maintained.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A system for holding patterns and lasts for shoes, permitting them to be shaped on the end and polished, which consists in seizing the last or pattern by means of claws or other suitable elements, which are applied upon the periphery of the last or pattern, adjacent a section situated about midway on the length of said last or pattern, the points of contact between the claws and the last or pattern being situated practically at the three vertices of an equilateral triangle or an isosceles triangle whose vertex is upon the lower face of the last, said triangle being inscribed in the section of the last, in such manner as to correspond equally well to the left last as to the right last.

2. A constructional form of the system of holding claimed in Claim 1, in which the centre of the circle circumscribed on the triangle coincides with the axis about which the last has been previously copied from its pattern.

3. A constructional form of the system of holding claimed in Claims 1 and 2 in which the claws are mounted radially at 120° from one another in a common support which comprises a mechanism such as a plate with a spiral allowing the forward motion of the clamps by equal quantities.

4. A constructional form of the system of holding claimed in Claims 1 and 2 in which, at the ends of the claws, are provided hollow arms which can be regulated and oriented, for example by means of ball-and-socket joints which allow them to move, which arms seize the projections or bosses of the pattern and the lasts.

5. A modification of the device claimed in Claim 4 in which the arms consist of a plate provided with two adjustable claws in order to seize the patterns or lasts, which comprise, in their middle part double nails or bosses.

6. An apparatus for placing the support of the claws as claimed in Claim 3

upon the pattern or last, comprising stocks mounted on guides and controlled by a screw with right and left hand thread, which maintains the said lasts or patterns between a point and a claw, the support being mounted in a removable manner in a circular holder secured to the main frame of the apparatus, substantially as described.

Dated this 3rd day of June, 1927.

MEWBURN ELLIS & Co.,
70—72, Chancery Lane, London, W.C. 2,
Chartered Patent Agents.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1927.

Fig. 5

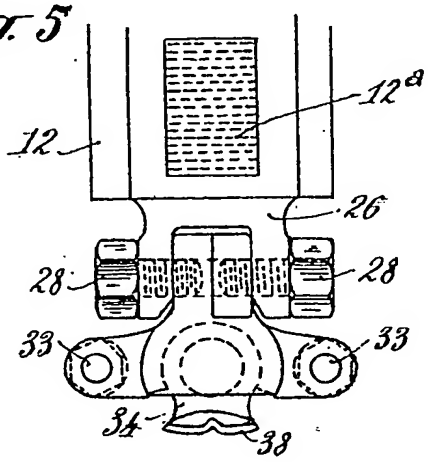


Fig. 6

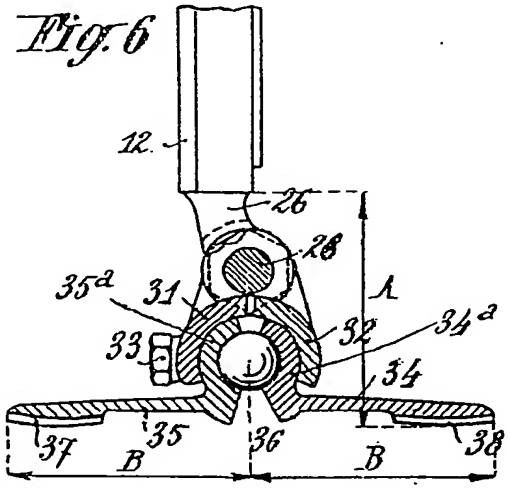


Fig. 7

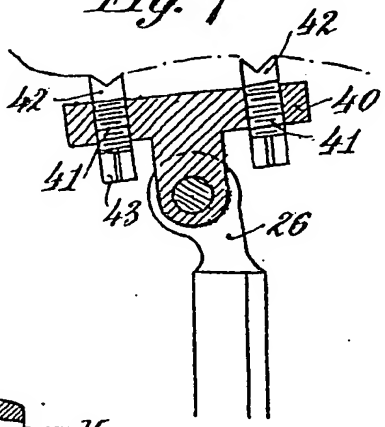
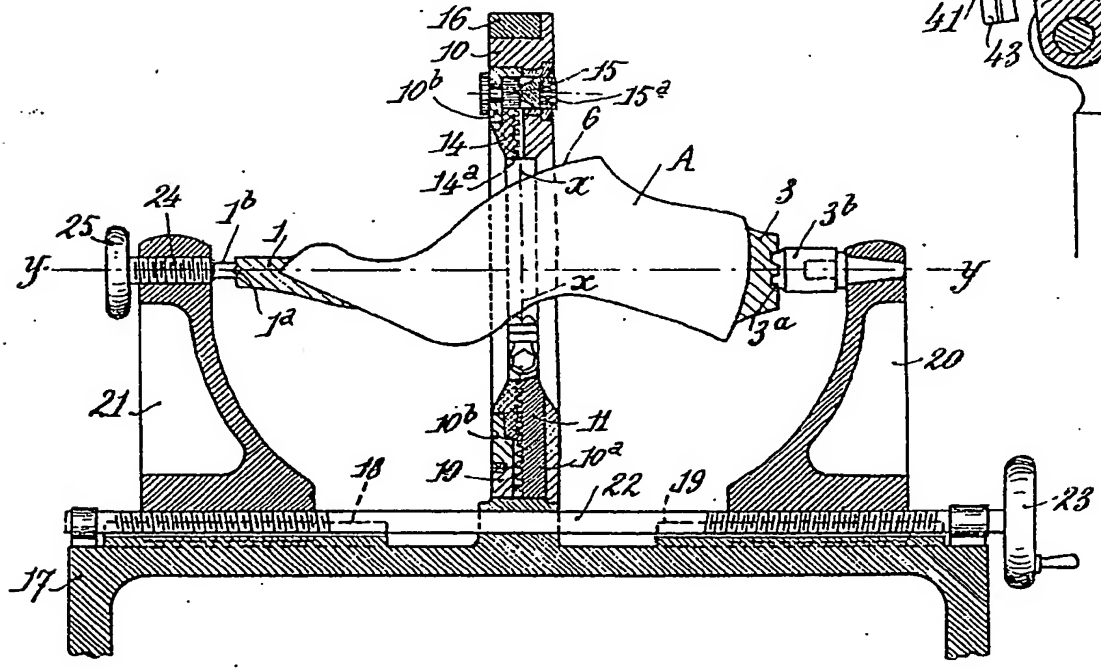


Fig. 1



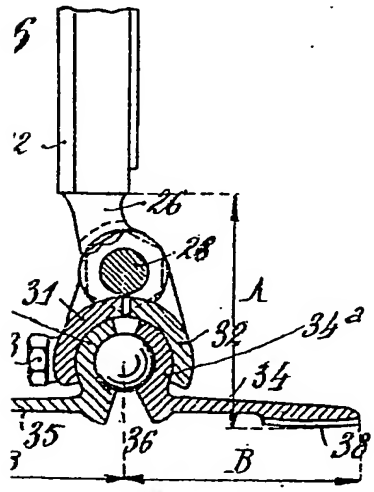


Fig. 3

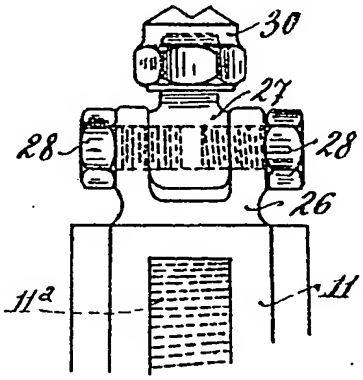


Fig. 4

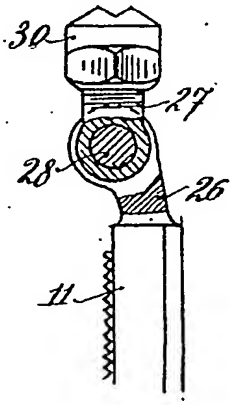


Fig. 7

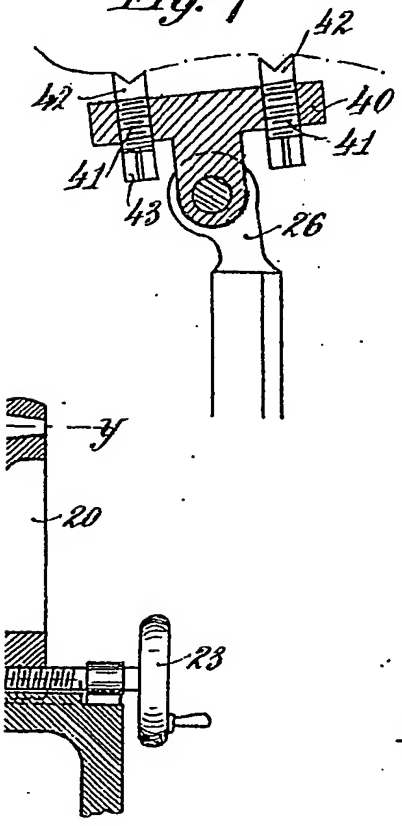


Fig. 2

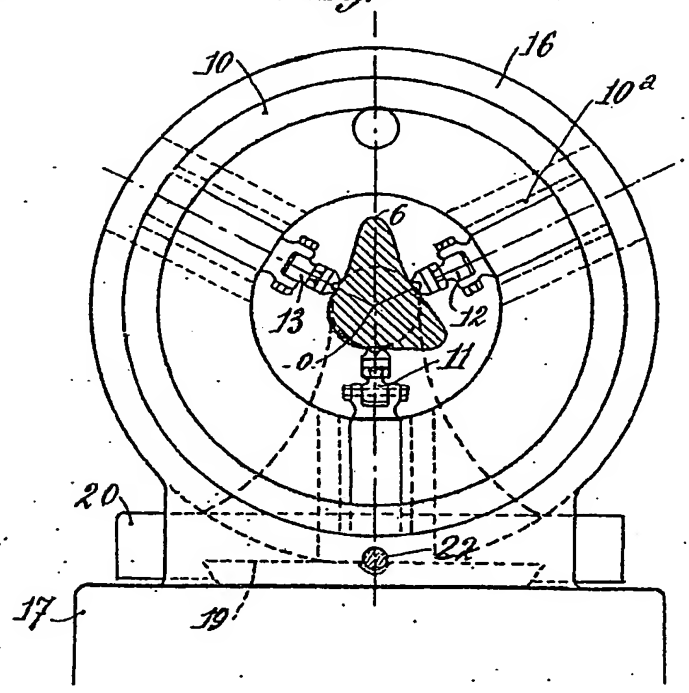


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Fig. 5

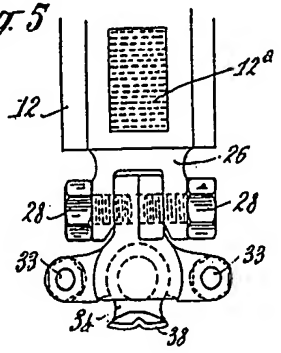

Fig. 6

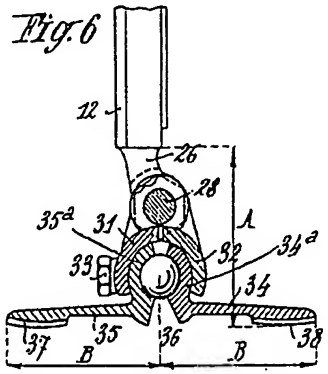

Fig. 3

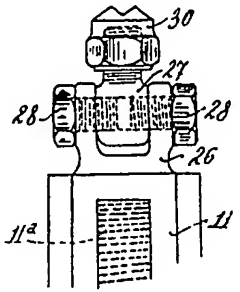

Fig. 4

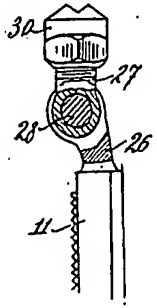

Fig. 7

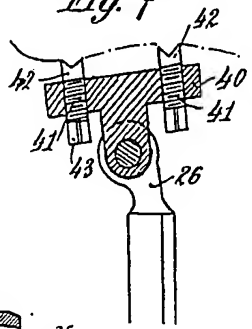

Fig. 1

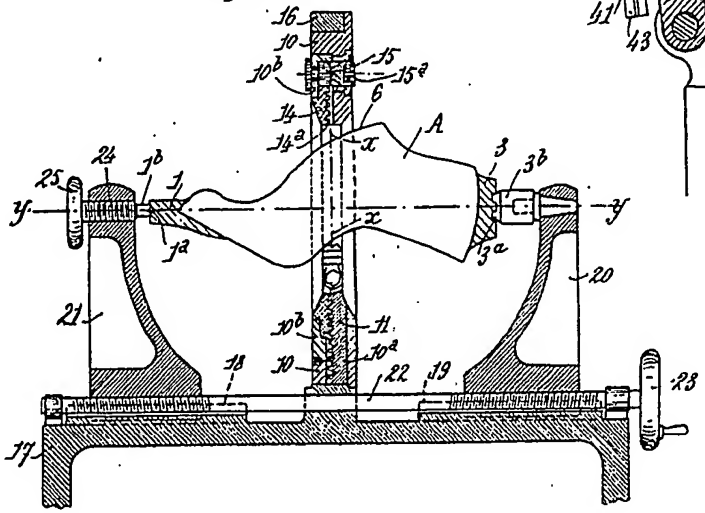

Fig. 2

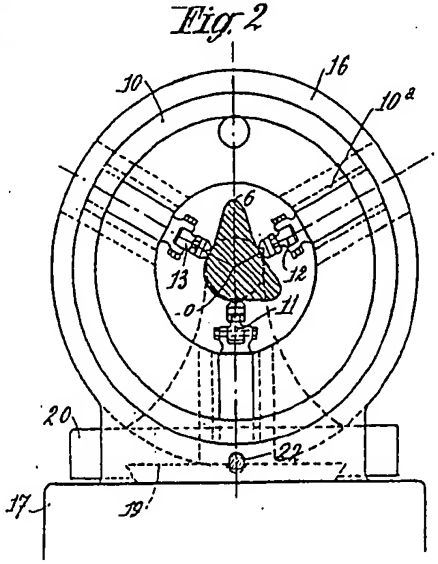

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Fig. 8

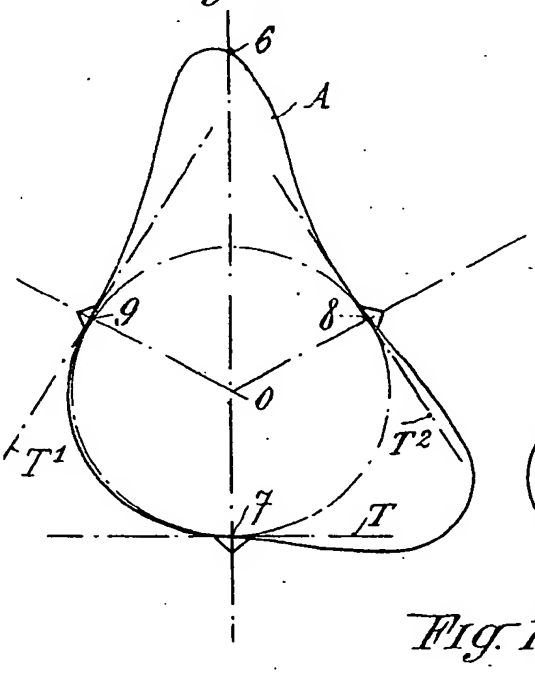


Fig. 9

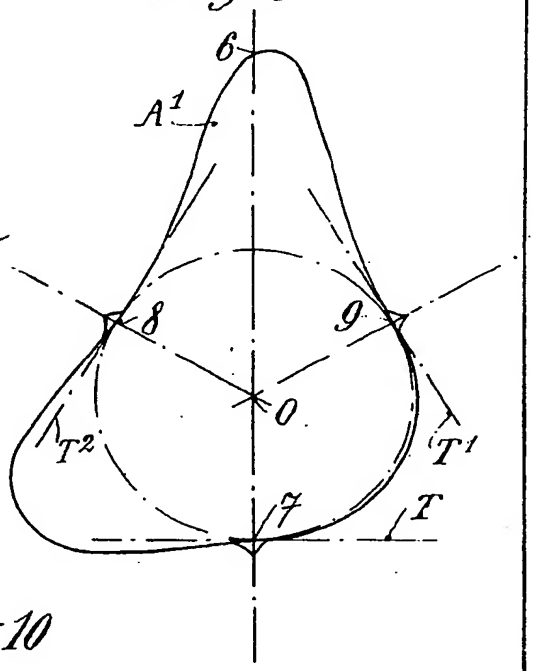
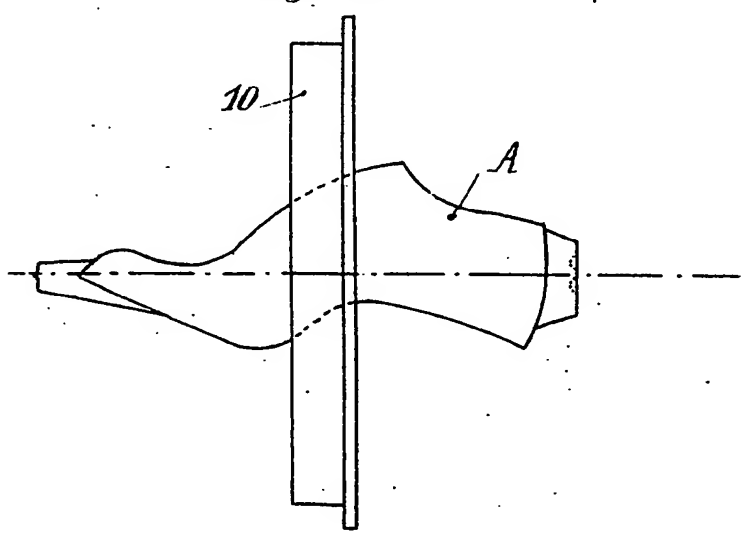


Fig. 10



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